

# Hydrolasing used in TMI decontamination data being evaluated

by Barbara Ettinger, TIO Office

After five months of preparation and many thousands of hours of work, the first large-scale decontamination experiment in the Three Mile Island Unit-2 reactor building was completed March 24, 1982. As part of the Department of Energy research and development program at the disabled reactor, EG&G Idaho personnel at the on-island Technical Integration Office were instrumental in organizing and directing the experiment. During the three-week experiment, GPU Nuclear and its subcontractors used a pressurized-water spray technique called hydrolasing to decontaminate reactor building areas.

Hydrolasing used water at temperatures ranging from approximately 70 to 140°F and under pressures of from 2000 to 6000 psi. Flowing at rates of from 15 to 25 gallons per minute, the water washed surface contamination from the walls and floors of the reactor building into drains and down to the building basement. From there, the water will be pumped through a contaminated-water processing system known as the Submerged Demineralizer System, which removes radioactive contaminants from the water. The water used in the experiment was itself a result of the accident, and had been decontaminated with the EPICOR II processing system prior to its use during large-scale decontamination.

During the eleven reactor building entries required to complete the experiment, teams of two to three technicians each reduced contamination levels in several reactor building areas. These areas included the reactor building dome, the 500-ton polar crane, the walk-ways on the top of the two D-rings (personnel shields which separate the reactor coolant system from the rest of the building), and the top of the reactor vessel missile shields. Also decontaminated were large tools, equipment, and floor surfaces on the operating deck, or 347-foot elevation, and overhead areas, walls and floors on the entry level, or 305-foot elevation.

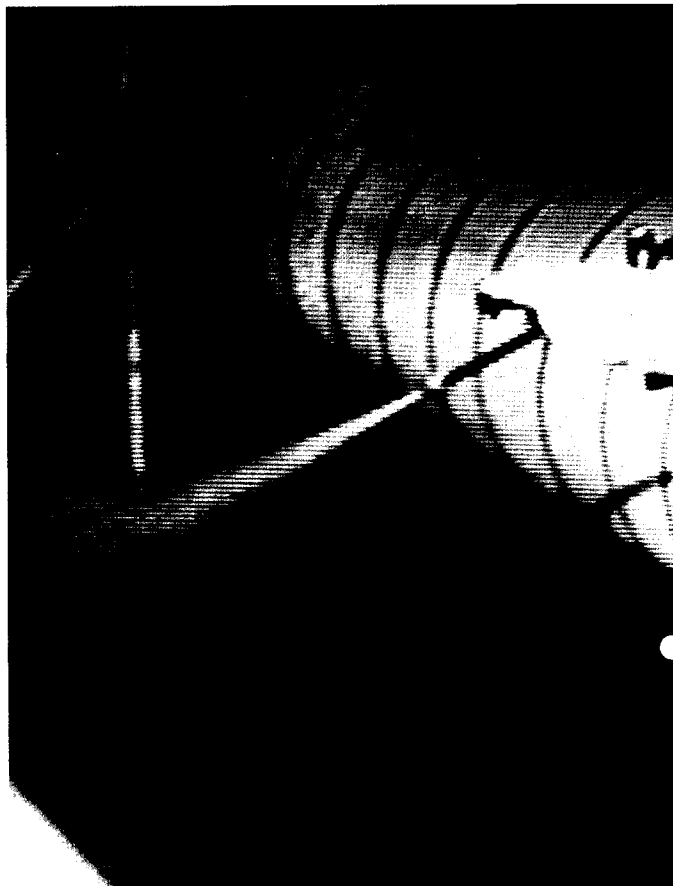
Although postdecontamination data are still being evaluated, Greg Eidam, EG&G Idaho's technical coordinator for the experiment, indicates that some preliminary information is available. "As we evaluate the techniques used, we are finding that, as anticipated, the hotter the water and the higher the pressure, the better the results from hydrolasing," explains Eidam. "We are currently evaluating exactly how much of a difference water temperature and pressure made."

In order to measure the effectiveness of the experiment and to compare pre- and postdecontamination conditions, samples and radiation readings of areas to be decontaminated were taken before and after the actual decontamination work occurred. EG&G Idaho's TMI-2 Programs Division directed this data acquisition work during several reactor building entries. In addition to general area radiation surveys, engineers and technicians conducted a number of specific data acquisition activities.

Engineers conducted gamma spectrometer measurements of the reactor building air coolers and on the 305- and 347-foot elevations. To check for iodine and particulates, air samples were taken in the basement and on the other elevations. Special thermoluminescent dosimeters (TLDs) designed for use at TMI provided general field surveys before and after the

experiment. Under the direction of Tom Cox in the Radiation and Environment section of EG&G Idaho's on-island TIO, Dave Hetzer and Bill Laney designed a special surface sampling device for the data acquisition work. Duke Anderson, Chuck McIsaac and Simon Rodriguez of the Physics Division and Bill Franz of the TIO used the sampler to obtain concrete and metal samples from reactor building floors, walls and metal surfaces. All of the samples gathered before the experiment will be analyzed and will be compared with similar samples taken after the experiment in order to assess the effectiveness of the work.

Analysis of all the pre- and post-decontamination samples is underway and documentation of the entire experiment has begun. The final report on the large-scale experiment will compare pre- and post-



THE FIRST LARGE-scale decontamination experiment in the TMI Unit 2 reactor building involved using a tech hydrolasing, in which a spray of water washed surface contamination from the walls and floors of the building.

## experiment;

decontamination survey and sample results and will evaluate the effectiveness of the different decontamination techniques in reducing radiation levels. According to Eidam, "the nuclear industry lacks documentation on decontamination techniques. Although decontamination has taken place at a number of national laboratories, none of the activities has been fully documented. The industry needs full documentation of all efforts involved in decontaminating a facility, including the failures and successes encountered during the entire process."

The final report on the large-scale decontamination experiment at TMI-2 will, in Eidam's words, "provide the nuclear industry with data needed to assist them in any future decontamination activities and in eventual plant decommissioning work."



called



JEFF COOK (center).

by Terry Smith, EG&G Idaho

## *It was the race of all races ... the marathon of all marathons*

There are other marathon races, but none quite like the Boston Marathon, says Jeff Cook, an engineering specialist with the Nondestructive Evaluation Branch of EG&G Idaho's Materials Technology Division.

Cook was one of about 12,000 runners who set out from rural Hopkinton, MA., on April 19, for the 26.2 mile race to downtown Boston. Three hours and 19 minutes later, Cook crossed the finish line.

It was the tenth marathon that Cook has completed. While he's posted better times than the one at Boston, he says the event stands out as the ultimate achievement in his five years of running.

"The Boston Marathon is special because it's the oldest marathon in the country. It's an opportunity to compete in an event with the best in the world. It's the only sport where someone who is average like me can compete with the champions," Cook says.

"It's a big community event. There are spectators lining the whole 26 miles cheering you and helping you. It's a great experience."

Cook says the atmosphere surrounding the event inspires people to put forth extraordinary effort. "One fellow pushed his son in a wheelchair the whole course of the race. There are a number of blind runners that participate in the event. I heard there was one fellow who fell and broke his leg at seven miles and still finished the race."

In order to compete as an official entry, a runner in the Masters Class has to qualify by posting a 3:10 time or better in another marathon on a certified course. Cook qualified for the Boston Marathon by making a 3:03:55

time at the Les Bois Marathon in Boise last November. Cook says the qualification requirement ensures that the runners, at least the official entries, are all in good condition.

He says the key to finishing a race such as the Boston Marathon is training hard before the event and relaxing during the race. Relaxing was especially important at Boston because it was a hot day. "It was a good day for the spectators, but a grueling day for the runners," Cook says.

"Running marathons is something a lot of people can do," he says. "If you put in the proper training, it's easy once you're in the race. It's the training that's important."

"A main part of training is the running," Cook says. "It's a good idea to do some running up hills, particularly if the race is going to involve hills. If a person is interested in racing a marathon, the training must also include speed work, not just jogging. You've got to get out and push. There's a difference between racing a marathon and just running to finish it."

Cook says he started marathon running because of its competitive nature. "I had a co-worker who was going to run in one and I thought that if he can do it I can do it."

There are other benefits of marathon running, he says. "It keeps you in top-notch physical condition and I want to stay that way. It helps me to perform better in other activities such as trail bike riding and cross country skiing."

Cook says he works hard now to improve his time. "My goal is to be able to get under three hours. That's a really tough goal to crack. I don't know whether I'll be able to do it, but I plan to try."